

Titan Balloon Convection Model, Phase I

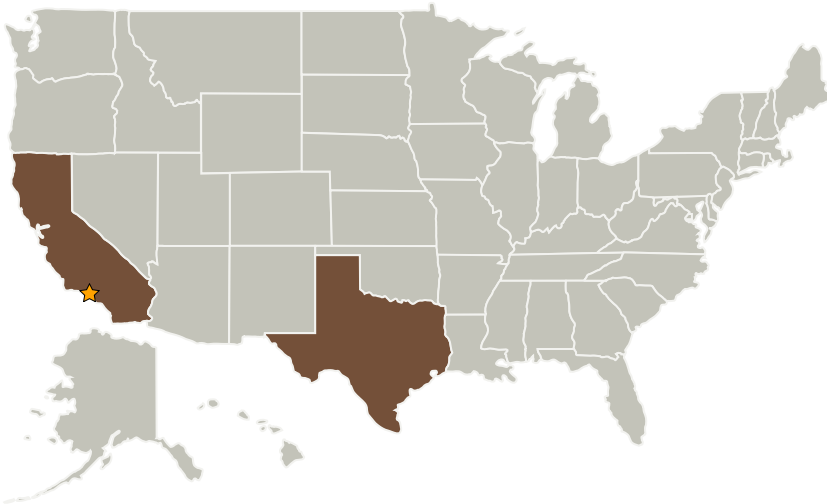
Completed Technology Project (2007 - 2007)



Project Introduction

This innovative research effort is directed at determining, quantitatively, the convective heat transfer coefficients applicable to a Montgolfiere balloon operating in an atmosphere simulating that of Titan. It is anticipated that a platform such as this will provide the mobility desired to explore that part of the solar system. Utilizing only the waste heat available from an on board power source, it should be possible to circumnavigate Saturn's largest moon. Accurate knowledge of free convection is essential for predicting the performance and mitigating the risk for such a mission. In order to simulate a volume of gas large enough to inflate a model balloon at 77K, vacuum insulation panels will be used to minimize the thermal losses. At the conclusion of this Phase I effort, a final report will establish the feasibility of this approach and describe the future applications of this technology.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory (JPL)	Lead Organization	NASA Center	Pasadena, California
Winzen Engineering, Inc.	Supporting Organization	Industry	San Antonio, Texas



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations

California

Texas

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
 - └ TX11.2 Modeling
 - └ TX11.2.1 Software Modeling and Model Checking